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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
TSAI, CAROL S W	
ART UNIT	**PAPER NUMBER**
2857	

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/021,895	SUN ET AL.	
	Examiner	Art Unit	
	Carol S Tsai	2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 September 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-129* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-129* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-129 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The claims 1, 32, 63, 94, 98, 101, 106, 110, 113, 118, 122, and 125 recite no clearly defined practical application of the claimed method or do not draw a conclusion as to the final end result of the model mathematical operation being directed toward a practical application. Additionally, the method claims do not fall into either of the "safe harbors" defined in the Guidelines for Computer-Implemented Inventions in that there is no manipulation of measured data representing physical objects or activities to achieve a practical application (pre-computer process activity) or the performance of independent physical acts (post-computer process activity). The examiner submits that the claimed process merely solves a model mathematical problem without limitation to a practical application.

Claims 1, 94, 106, and 118, recites signal analysis that is not tied to any physical structure for receiving, transmitting or constructing the data signal. The Examiner submits that the claimed method consists solely of the manipulation of an abstract idea is not concrete or tangible.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
> (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

4. Claims 1-5, 8, 9, 32-36, 39, 40, 63-67, 70, 71, 94, 95, 98, 99, 101, 102, 106, 107, 110, 111, 113, 114, 118, 119, 122, 123, 125, and 126, are rejected under 35 U.S.C. 102(e) as being anticipated by U. S. Publication 2003/0004664 to Ward et al.

With respect to claims 1, 9, 32, 40, 63, 71, 94, 98, 101, 106, 110, and 113, Ward et al. disclose a method of analyzing a measurable distribution having random components and deterministic components, comprising the steps of: (a) collecting data from a data signal (data waveform 100 shown on Fig. 1) (see paragraph 0018); (b) constructing a probability density function based on the data such that tile probability density function defines a distribution, wherein the probability density function is a convolution of deterministic functions and random functions (total jitter 120 shown on Fig. 1) (see Figs. 4, 6, 7, and 10 and paragraphs 0003, 0007, 0026, 0028, and 0036); (c) construct a probability density function based on a convolution model having three or more parameters wherein at least one of the parameters are unknown, the convolution model having a deterministic model and a random model (see Figs. 6 and 7; Abstract, lines 5-7; and paragraphs 0003, 0007, 0018, 0037, 0038, and 0042); (d) determining

unknown parameters by using a deconvolution process employed upon the probability density functions constructed in steps (b) and (c) (see Fig. 1 and paragraphs 0018, 0020, and 0036-0047).

As to claims 118, 122, and 125, Ward et al. also disclose a method of analyzing a variation distribution having random components and deterministic components, comprising the steps of: (a) receiving reference data and a data record that is descriptive of a signal (see paragraph 0021); (b) constructing a probability density function based on the variation between the data record and the reference data such that the probability density function defines a distribution, wherein the probability density function is a convolution of deterministic functions and random functions (total jitter 120 shown on Fig. 1) (see Figs. 4, 6, 7, and 10 and paragraphs 0003, 0007, 0021, 0026, 0028, and 0036); (c) constructing a probability density function based on a convolution model having three or more parameters wherein at least one of the parameters are unknown, the convolution model having a deterministic model and a random model (see Figs. 6 and 7; Abstract, lines 5-7; and paragraphs 0003, 0007, 0018, 0037, 0038, and 0042); (d) determining unknown parameters by using a deconvolution process employed upon the probability density functions constructed in steps (b) and (c) (see Fig. 1 and paragraphs 0018, 0020, and 0036-0047).

As to claims 2, 33, and 64, Ward et al. also disclose the deterministic model having a deterministic parameter and the random model having two or more random parameters (see Figs. 3 and 10 and paragraphs 0037-0046).

As to claims 3, 34, and 65, Ward et al. also disclose the deterministic parameter being time location (see paragraphs 0004, 0021, and 0037).

As to claims 4, 35, and 66, Ward et al. also disclose the deterministic model has at least one time location parameter and at least one magnitude parameter (see Figs. 6 and 7 and paragraphs 0004, 0021, 0036, and 0037).

As to claims 5, 36, 67, 95, 99, 102, 107, 111, 114, 119, 123, and 126, Ward et al. also disclose formulating an inverse problem; and solving the inverse problem to extract the parameters (see paragraph 0037).

As to claims 8, 39, and 70, Ward et al. also disclose the distribution being a signal distribution (see paragraphs 0002, 0007, 0030, and 0034).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 6, 7, 37, 38, 68, and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ward et al. in view of U. S. 2001/0036228 to Skafidas et al.

As noted above, with respect to claims 6, 37, and 68, Ward et al. disclose the claimed invention, except for the inverse problem being solved via a recursive solution.

Skafidas et al. teach the inverse problem being solved via a recursive solution (see paragraph 0034).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Ward et al.'s method to include the inverse problem being solved

via a recursive solution, as taught by Skafidas et al., in order that an estimate of original data can be recovered by demodulating the estimated modulated data (see Skafidas et al., paragraph 0011, lines 14-16).

As to claims 7, 38, and 69, Ward et al. do not disclose the inverse problem being solved via an optimizer based solution.

Skafidas et al. teach the inverse problem being solved via an optimizer based solution (see paragraphs 0056-0063).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Ward et al.'s method to include the inverse problem being solved via an optimizer based solution, as taught by Skafidas et al., in order that data received from a communications channel can be equalized and distortion and noise from the data can be removed (see Skafidas et al., paragraph 0002, lines 3-5).

7. Claims 10-14, 17-19, 21-25, 28-30, 41-45, 48-50, 52-56, 59-61, 72-76, 79-81, 83-87, 90-92, 96, 97, 100, 103-105, 108, 109, 112, 115-117, 120, 121, 124, and 127-129, are rejected under 35 U.S.C. 103(a) as being unpatentable over Ward et al. in view of U. S. 2002/0003843 to Martone.

As noted above, with respect to claims 10, 18, 21, 29, 41, 49, 52, 60, 72, 80, 83, 96, 100, 103, 108, 112, 115, 120, 124, and 127, Ward et al. disclose the claimed invention, except for at least one random model parameter is known, wherein the determining step further comprises the step of: determining a deterministic model parameter based on the known random model parameter by using a deconvolution process.

Martone teaches at least one random model parameter is known, wherein the determining step further comprises the step of: determining a deterministic model parameter based on the known random model parameter by using a deconvolution process (see paragraph 0070).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Ward et al.'s method to include at least one random model parameter is known, wherein the determining step further comprises the step of: determining a deterministic model parameter based on the known random model parameter by using a deconvolution process, as taught by Martone, in order that a jitter correction can be provided to minimize signal measuring inaccuracy effects in a signal processing system.

As to claims 11, 22, 42, 53, 73, 84, 97, 105, 109, 117, 121, and 129, Ward et al. also disclose the deterministic model having a deterministic parameter and the random model having two or more random parameters (see Figs. 3 and 10 and paragraphs 0037-0046).

As to claims 12, 23, 43, 54, 74, and 85, Ward et al. also disclose the deterministic parameter being time location (see paragraphs 0004, 0021, and 0037).

As to claims 13, 24, 44, 55, 75, and 86, Ward et al. also disclose the deterministic model has at least one time location parameter and at least one magnitude parameter (see Figs. 6 and 7 and paragraphs 0004, 0021, 0036, and 0037).

As to claims 14, 19, 25, 30, 45, 50, 56, 61, 76, 81, 87, 92, 104, 116, and 128, Ward et al. also disclose formulating an inverse problem; and solving the inverse problem to extract the parameters (see paragraph 0037).

As to claims 17, 28, 48, 59, 79, and 90, Ward et al. also disclose the distribution being a signal distribution (see paragraphs 0002, 0007, 0030, and 0034).

8. Claims 15, 16, 26, 27, 46, 47, 57, 58, 77, 78, 88, and 89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ward et al. in view of Martone as applied to claims 1, 10, 14, 21, 25, 32, 41, 45, 52, 56, 63, 72, 76, 83, and 87, above, and further in view of U. S. 2001/0036228 to Skafidas et al.

As noted above, with respect to claims 15, 26, 46, 57, 77, and 88, Ward et al. in combination with Martone teach all the features of the claimed invention, but do not disclose the inverse problem being solved via a recursive solution.

Skafidas et al. teaches the inverse problem being solved via a recursive solution (see paragraph 0034).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Ward et al. in combination with Martone's method to include the inverse problem being solved via a recursive solution, as taught by Skafidas et al., in order that an estimate of original data can be recovered by demodulating the estimated modulated data (see Skafidas et al., paragraph 0011, lines 14-16).

As to claims 16, 27, 47, 58, 78, and 89, Ward et al. in combination with Martone do not disclose the inverse problem being solved via an optimizer based solution.

Skafidas et al. teach the inverse problem being solved via an optimizer based solution (see paragraphs 0056-0063).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Ward et al. in combination with Martone's method to include the inverse problem being solved via an optimizer based solution, as taught by Skafidas et al., in

order that data received from a communications channel can be equalized and distortion and noise from the data can be removed (see Skafidas et al., paragraph 0002, lines 3-5).

9. Claims 20, 31, 51, 62, 82, and 93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ward et al. in view of Martone as applied to claims 1, 10, 18, 19, 21, 29, 30, 32, 41, 49, 50, 52, 53, 60, 61, 63, 72, 80, 81, 83, 91, and 92 above, and further in view of U. S. Patent No. 6,028,895 to Dinsed et al.

As noted above, with respect to claims 20, 31, 51, 62, 82, and 93, Ward et al. in combination with Martone teach all the features of the claimed invention, but do not disclose the inverse problem being solved via a closed solution.

Dinsed et al. teach the inverse problem being solved via a closed solution (see col. 1, line 38 to col. 2, line 29).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Ward et al. in combination with Martone's method to include the inverse problem being solved via a closed solution, as taught by Dinsed et al., because a non-recursive structure can be utilized to avoid introducing errors into the results of the measurement by component tolerance, aging phenomena and temperature variations contributed to the high precision.

Response to Arguments

10. Applicant's arguments filed 09/02/2003 have been fully considered but they are not persuasive.

Applicants argue that Ward does not teach a deconvolution process that is employed upon probability density functions because Ward teaches a method of separating deterministic and random jitter components from a total jitter time train that is employed upon a time-domain data series. The Examiner disagrees with Applicants. As set forth above, Ward et al. do disclose a deconvolution process that is employed upon probability density functions (see Figs. 6 and 7 and paragraph 0036).

Applicants requested reconsideration and withdrawal of the rejection under 35 U.S.C. §101 because that claims 1-93 involves manipulating data relating to a tangible thing (a signal) and serves a concrete, tangible, useful purpose (separating deterministic and random caused of signal distortion). The Examiner disagrees with Applicants. It is noted that claims 1-93 serves a concrete, tangible, useful purpose (**separating deterministic and random caused of signal distortion**) is not recited in the rejected claim(s).

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol S. Tsai whose telephone number is (703) 305-0851. The examiner can normally be reached on Monday-Friday from 7:30 AM to 4:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (703) 308-1677. The fax number for TC 2800 is (703) 308-7382. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2800 receptionist whose telephone number is (703) 308-1782.

In order to reduce pendency and avoid potential delays, Group 2800 is encouraging FAXing of responses to Office actions directly into the Group at (703) 308-7382. This practice may be used for filing papers not requiring a fee. It may also be used for filing papers which require a fee by applicants who authorize charges to a PTO deposit account. Please identify the examiner and art unit at the top of your cover sheet. Papers submitted via FAX into Group 2800 will be promptly forwarded to the examiner.

Carol S. W. Tsai

10/05/03

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